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HERBERT JOHN WEBBER

While gathering oranges in his yard from a tree which he had planted and raised, Dr. Webber suffered a heart attack which was followed by his death on January 18, 1946, shortly after he had reached his eightieth birthday. That his last activity should have been concerned with a fruit which he had studied in one way and another for half a century seems eminently fitting to those who knew him well.

Affable, genial, unselfish, alert, energetic and optimistic, he merited that esteem of colleagues and students which he received. A charter member of the California Botanical Society, he was an enthusiastic and loyal member of the organization. Prominent also in the founding and work of the Botanical Society of America and of the American Genetic Association, his cooperation was freely given to promote welfare of science.

His never-tiring interest in plants endeared him to his teacher, Bessey, at the University of Nebraska, who inspired him with the active scientific spirit which dominated his subsequent life. Webber received the degree of B.S. in 1889 and A.M. in 1890 at the University of Nebraska. He did graduate work at Washington University, obtaining the degree of Ph.D. in 1901. The scientific study of living plants in the out-of-doors became a passion with him when, in 1892, he went to Eustis, Florida, in the service of the United States Department of Agriculture to investigate problems connected with the citrus industry, in association with Walter T. Swingle. At once Webber was fascinated with the new problems in botany in that subtropical region. Writing to Bessey, he waxed enthusiastic about the unique distribution of plants in the hammocks and sandy plains, was excited by the discovery of plants like *Zamia* and *Casuarina*, and the alluring field of citrus culture. In view of his later importance in that field, his remark in a letter to Bessey had singular significance. "Orange studying I find a delight. Hope I may continue to like it as well."

The primitive spermatophyte, *Zamia*, so aroused his scientific curiosity that he somehow found time, aside from his regular

duties, to study it. His first paper, entitled "Peculiar Structures Occurring in the Pollen Tube of *Zamia*," published in the *Botanical Gazette* in June, 1897, announced that the male gametophyte produces motile antherozoids. Two more papers followed in rapid succession, establishing this novel discovery. When he read a paper containing the results of his researches at the meeting of the Botanical Society of America at Toronto in that year, he knew that it would be difficult to convince his audience that a seed-plant has motile antherozoids, therefore he showed slides representing all the important stages. Fortunately for him the mature antherozoids of *Zamia* are probably the largest male gametes known in the plant kingdom, being plainly visible to the naked eye. Still, there was incredulity in the minds of many botanists. Rodgers says, "Some went so far as to believe that Webber's sanity had been affected by the warm climate of Florida." The following year Webber read a paper at the Boston meeting of the American Association for the Advancement of Science in which he described the formation of the cilia-bearing membrane of the antherozoid. In 1901 Webber's work on *Zamia* was culminated with the publication of his researches by the United States Department of Agriculture in a ninety-two page, fully illustrated paper.

His discovery of motile antherozoids in *Zamia*, his cooperation with W. T. Swingle in producing the first interspecific hybrids in *Citrus* having resistance to low temperatures, his influence on the development of genetics in the Department of Agriculture in Washington and at Cornell, established Webber's scientific abilities at home and abroad while he was still a young man.

His hybridization of species and varieties of citrus led him to ponder the principles of heredity and he was alert to the new possibilities in the laws of Mendel, rediscovered in 1900 by DeVries and Correns, and in DeVries' theory of mutation published in the same year. For the next quarter of a century Webber's name was linked to studies on the breeding of oranges, cotton, corn, pineapples, timothy and potatoes. He was appointed in 1900 to be "Physiologist in Charge of the Laboratory of Plant Breeding" in the United States Department of Agriculture where he was successful in introducing scientific principles into the agricultural work in this and other countries.

In 1907 Webber was called to a professorship of experimental plant biology at Cornell University where he worked for five years, resigning to take the directorship of the newly founded University of California Citrus Experiment Station and Graduate School of Tropical Agriculture. He arrived in Riverside in July, 1913, and threw himself into the tasks concerned with organizing the new institution, building up an Experiment Station which now has an international reputation for its researches in subtropical horticulture and related problems.

At the invitation of the department of agriculture of the Union of South Africa, he spent the year 1924-25 in studying the citrus industry in that country and advising the government on the organization of agricultural education and research. Thence he visited various citrus growing regions in the Orient and completed a journey around the world.

Dr. Webber was appointed chairman of the Division of Sub-tropical Horticulture in the College of Agriculture, University of California, in 1921 and took up residence at Berkeley; served as acting dean of the College and Director of the Experiment Station in 1923-24; returned in 1926 to Riverside to resume his former position as Director of the Citrus Experiment Station; became professor emeritus in 1936. He knew no such a thing as retirement however, going daily to his quarters in the building or making studies in the orchards, or discussing horticultural matters with members of the staff.

One of his first accomplishments in 1913 at Riverside was the formation of the Synapsis Club, an informal seminar, debating society, colloquium, which has afforded the opportunity for the workers in the sciences connected with horticulture to report on their researches and, more important, to get the criticisms of their comrades in science. Membership in the Synapsis Club was composed of staff members of the Citrus Experiment Station and of the branches of the United States Department of Agriculture stationed in southern California, but interested citrus growers were welcome at the meetings. That this Club has carried on for more than thirty years is strong evidence of the foresight and wisdom of the founder.

This is not the place to review Dr. Webber's voluminous scientific writings which were published for the benefit of botanical and agricultural workers at home and abroad, but reference must be made of his crowning success in planning and producing, in collaboration with Dr. L. D. Batchelor, of the great work entitled "The Citrus Industry" in three volumes. The first volume was published by the University of California Press in 1943, and the second will be ready shortly. In scope and wealth of information it far surpasses anything of the sort ever attempted. In addition to editing the work, Dr. Webber wrote over 300 pages of the first volume, including a comprehensive chapter on the cultivated varieties of *Citrus*. The second volume will be devoted to matters concerned with the production of the crops, to which Dr. Webber has contributed two chapters: "Nursery Methods" and "Citrus Rootstocks; Their Characters and Reactions."

Dr. Webber married on September 8, 1890, Lucene Anna Hardin (deceased August 16, 1936). Their children were Mrs. Eugene Frances (Webber) Morrison, Mrs. Fera Ella (Webber) Shear, Herbert Earl Webber and John Milton Webber.—HOWARD S. REED, Department of Botany, University of California, Berkeley.